

A New Method for ERP Implementation Based on Business Function Analysis and Identification of Vocational Business Enterprises (BUMDes) in Toba

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Abstract--- BUMDes is a business entity and unit that the whole or most of the capital is owned by the village by involving directly and comes from the village wealth that has been separated. In Toba Regency, there are 102 BUMDes with 131 units engaged in 6 business sectors, 25 units engaged in social issues, 9 units moving in the field of brokering, 11 units engaged in rental, 65 units engaged in trade, 20 units engaged in finance, and 1 unit engaged in holding. BUMDes are classified as Micro, Small and Medium Enterprises (MSMEs). To increase market share and enhance MSME competitiveness, MSMEs need support such as an application that can integrate all MSME business processes. The application system is Enterprise Resource Planning (ERP). ERP is a corporate resource planning system that aims to integrate the entire business process of the company. Through ERP, companies can also increase the visibility of the work of organizations so as to enable companies to make decisions at a managerial level that is better and more effective. This study conducted a literature study to produce 3 ERP Open Source most commonly applied to BUMDes, namely Odoo, Adempiere, and Dolibarr and 7 modules that are often implemented in implementing ERP on MSMEs namely Invoicing, Sales, Purchase, Manufacturing, Inventory, CRM, and HRM. This research produces ERP, Functional Area, Business Function, and Data used in ERP implementation and implementation guidance documents in accordance with the ERP and Functional Area produced.

Keywords--- ERP, BUMDes, Functional Area, Business Function, Data

I. INTRODUCTION

According to Law No. 6 of 2014 states a village is a community association that legally has territorial boundaries and has the authority to regulate and manage governance issues and the interests and needs of surrounding communities based on community initiatives, original rights, and / or traditional rights that have recognition and respect from the government system of the Unitary Republic of Indonesia (NKRI). The village is required to carry out development as an effort to improve the quality and welfare of the village community. The village development in question is the physical development and resources of the village [1].

Efforts to improve the welfare and quality of villages can be done by seeking development of resources that increase Village Original Income (PADes) [2]. One way for the government to increase PADes is to establish a Village-Owned Enterprises (BUMDes) regulated by the Regulation of the Minister of Villages, Development of Disadvantaged Areas, and Transmigration of the Republic of Indonesia Number 4 of 2015 [3]. BUMDes is a business entity and unit that the whole or most of the capital is owned by the village by involving directly and comes from the village wealth that has been separated. This serves to manage assets, services, and other efforts to improve the welfare of rural communities (Law Number 32 of 2004) [4].

In Toba Regency, there are 102 BUMDes engaged in various fields. BUMDes are classified as Micro, Small and Medium Enterprises (MSMEs). SMEs are labor-intensive businesses, do not require certain requirements such as the level of education, expertise

(skills) of workers, and the use of relatively little business capital and the technology used tends to be simple. Small and medium businesses (SMEs) are an important part of a country's or regional economy. Various efforts to develop SMEs have been carried out, one of them is by raising and multiplying new people or entrepreneurs in the field of SMEs, so that rural communities are given skills in the hope that these skills will become a creative endeavor that will benefit the economy of the family and village community [5]. MSMEs play an important role in reducing poverty and unemployment in Indonesia. In 2013, MSMEs in Indonesia reached 57.9 million units or 99.99% of the company's total business [6]. To increase market share and enhance MSME competitiveness, MSMEs need support such as an application that can integrate all MSME business processes [4]. UMKM must be able to meet the demands of the community, namely the speed of service needs of the community. To overcome these problems, it is necessary to implement an ERP (Enterprise Resource Planning) system. Implementing an ERP system is useful to meet business strategies, improve business process performance, improve operating quality and efficiency to simplify the flow of operations, improve quality and reduce lead time, shorten turn-around time to customers and support the development of globalization [7]. ERP integrates business processes related to sales, production, resource management, and investment accounting records in one centralized database so that it is more efficient. ERP affects the improvement of quality and productivity of important areas in MSMEs such as product quality, reducing costs and customer service with a computerized system so as to increase efficiency and facilitate management in making and making decisions. Increasing the efficiency and effectiveness of MSMEs will improve management performance. Improved management performance will be in line with increased profitability [8]. An ERP system is able to increase cooperation between corporate entities, simplify company business processes, and also be able to improve services and service productivity for customers so that it can spur increased customer satisfaction with company services. Through ERP, companies can also increase the visibility of the work of organizations so as to enable companies to make decisions at a managerial level that is better and more effective. Based on the study of ERP, it has been proven that the ERP system not only functions as a software package suitable for a single company or organization, but the infrastructure of an organization that has an influence on how humans work and directs that logic to be applied as a strategy and manner and corporate culture or the organization [9]. However, there are factors that cause MSMEs not wanting to implement an ERP system. These factors are the cost of implementation and licensing which are known to be expensive and are less likely to succeed in adopting an ERP system. This often happens due to the incompatibility of the ERP system with the business process of the company or organization [10].

Therefore, in conducting this research, the research team will analyze and identify existing business functions in ERP which are then classified and conduct an analysis and identification of the BUMDes business function in Toba. Existing business functions in ERP and BUMDes will be mapped to find the right ERP for

BUMDes in Toba. This research will also produce a new method that will be used in implementing ERP in accordance with the needs of BUMDes in Toba. The method will be tested and evaluated at one of the BUMDes in Toba.

II. THEORETICAL BASIS

The stages of this research were conducted to produce the right method for ERP implementation in BUMDes Toba.

A. *BUMDes Classification*

According to the Village Law (Law Number 6 Year 2014) a village is a group of people who live in a certain area that is recognized and respected in the NKRI system. The village has the right to regulate and organize the interests of government and the needs of initiatives, original rights and or traditional rights. The village is obliged to carry out development in its area both physically and human resources with the aim of improving the quality of life for the welfare of the village community [1].

Six BUMDes business forms according to the Regulation of the Minister of Villages, Development of Disadvantaged Areas and Transmigration of the Republic of Indonesia 4 of 2015 Article 2019 [6].

1. Social business.
Social businesses are expected to be able to perform public services even if they do not get large financial benefits. Some examples of social businesses are the village electricity business, the village drinking water business and the village food barn business.
2. Rental business
BUMDes rents out goods for the purpose of serving the village community and obtaining village income. Examples of these businesses are transportation equipment rental, shop houses, land / building rental owned by BUMDes and party equipment rental.
3. An intermediary / brokering business
BUMDes provides services in the form of services to rural communities. Examples of intermediary businesses are electricity / water fee payment businesses and product delivery services.
4. Trading business
BUMDes sells goods that are produced by themselves or other products to meet the needs of the community. Examples of trading businesses are selling through BUMDes ice factories, selling agricultural products and other business activities.
5. A financial business
Financial business is expected to be able to help the needs of micro businesses conducted by the business community. One example of a financial business is a savings and loan business.
6. A joint venture / holding
BUMDes can run a joint business (holding) as the parent of business units developed by the Village community both on a local scale Village and rural areas. Each of

these units is independent, regulated and arranged by the BUMDes in order to grow a joint venture. An example is the development of large-scale village vessels to organize small fishermen so that their business becomes more expansive, village tourism organizes a range of business types from community groups, joint business activities that consolidate other types of local businesses.

At the moment Toba Regency (2020) has 102 BUMDes that have not yet been classified. At this stage, the research team will carry out classification based on the Regulation of the Minister of Villages, Development of Disadvantaged Regions, and Transmigration of the Republic of Indonesia Number 4 of 2015 Article 19. The classification is based on the type of business of each BUMDes.

B. ERP System Analysis

Enterprise Resource Planning (ERP) is a computer-based integrated system designed for processing company transactions and facilitating integrated and real time planning, production, and customer response. ERP software encourages the efficiency of operations of business processes by integrating interconnected tasks such as sales, accounting, and management of human resources in the company. ERP systems are important tools for business planning processes, information flow, and systems that help in controlling the resources of the company (finance, materials, equipment, labor) in different places [7].

At this stage, the research team will conduct an ERP system analysis. Analysis will be done to get the ERP that suits the needs of BUMDes. In addition, an ERP system is also carried out to get the right ERP application that is in line with the needs of BUMdes in Toba.

C. ERP Life Cycle

Implementing an ERP system is a complex and time-consuming project because the ERP system aims to integrate all business processes in the company. ERP implementation is often over budget, time is scheduled and quite [8]. A risky implementation causes the importance of having an implementation strategy. Implementation of the strategy must include aspects of technology, budget, methodology, time, goals, vision, and management [9]. One important factor is the implementation method used to implement ERP. At this stage, the research team will implement ERP with ERP Lifecycle by Esteves and Pastor

The life cycle framework according to Esteves and Pastor is as follows [10].

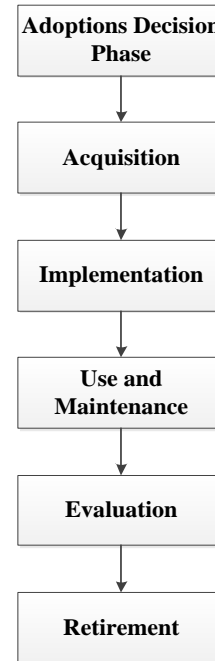


Fig 1 ERP Life Cycle by Esteves and Pastor

- i. **Adoptions Decision Phase**
In this phase, the needs of the new ERP system are checked to suit the organization. Business needs, the nature of operations, goals and objectives of the company are analyzed carefully. An analysis of the impact of the ERP system on the company is also determined before deciding to adopt ERP. This is needed to assess organizational readiness, management support and the skills needed before the decision to adopt ERP.
- ii. **Acquisition Phase**
This phase involves the selection of vendors and the best ERP software that suits business needs. The price offered by each vendor, the function of the ERP product, the training needed are some important factors that are considered for choosing an ERP system from the vendor. Choosing the right ERP system for the organization will minimize the risk of ERP implementation and increase the likelihood of success.
- iii. **Implementation Phase**
In this phase, synchronizing existing business processes with ERP software business processes. ERP software customization may be needed to meet the specific needs of the business. This phase also involves testing the ERP system and providing training in the use of the new system. This is necessary for test data, procedures and processes before using an ERP system to minimize errors after deployment.
- iv. **Use and Maintenance Phase**
In this phase, the ERP system is already in the running stage. This system needs to be corrected if damage occurs in the system. End users will be trained to use ERP systems so that the benefits of the system can be obtained.
- v. **Evolution Phase**
The importance of upgrading ERP systems to improve business performance and obtain additional benefits. The evolution of functions in ERP systems is provided in such a way as to enable

decision making such as advanced planning and schedules, data warehouse and business intelligence systems. The evolution from the outside is that the ERP system is integrated with the web and E-Commerce.

vi. Retirement Phase

If the long-term use of an ERP system becomes vulnerable to problems due to technological changes, the country's business rules are recommended for ERP system retirement (not used anymore). When the ERP system began to be difficult to modify and develop to meet the needs of new business that is constantly changing. The manager can decide to replace the ERP system with another new ERP system with the latest functionality needed.

D. ERP Module Analysis

At this stage, the research team will conduct an ERP module analysis with a systematic review.

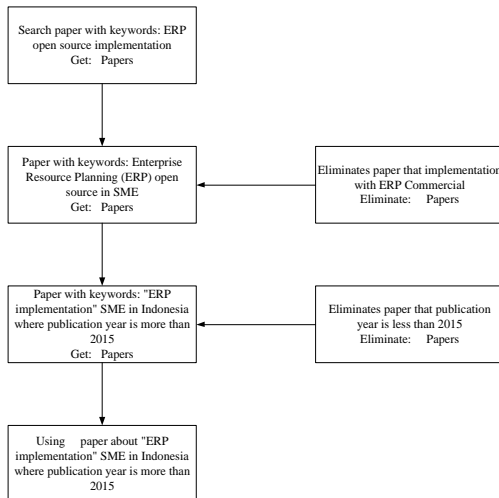


Fig 2 Systematic Review

This analysis is used to obtain the modules that are most often implemented in Micro, Small and Medium Enterprises (MSMEs). Then, one ERP module will be mapped to another ERP based on the same definition and function. This analysis is also used to produce the main module design.

E. Evaluation

Evaluation in this study will be carried out by implementing ERP on each BUMDes type. The ERP implementation uses Esteves and Pastor approaches. The BUMDes data that carry out the implementation are as follows:

BUMDes Name : Dosroha
Address : Pardomuan Motung, Ajibata
Type of business : Trading Business (Fertilizer)

III. RESULT AND DISCUSSION

A. BUMDes

In Toba Regency (2020) there are 102 BUMDes with 131 units in them. These BUMDes units are classified into 6 types of businesses based on the Regulation of the Minister of Villages, Development of Disadvantaged Areas, and Transmigration of the Republic of Indonesia Number 4 of 2015 Article 19. Following are the results of BUMDes classification

1. There are 25 units of BUMDes type of social business
2. There are 11 units of BUMDes type of rental business
3. There are 9 units of BUMDes type of brokerage business
4. There is 1 unit of BUMDes type of joint venture / holding
5. There are 65 units of BUMDes type of trading business
6. There are 20 units of BUMDes type of financial business

B. ERP System

The three ERPs that are derived from the analysis are 3 Open source ERP that is suitable for BUMDES. The three ERPs are Odoo, Adempiere and Dolibarr. Apart from the relatively low cost of implementation, the three ERPs also have complete features / modules that can meet the needs of the BUMDes.

C. ERP Module / Functional Area

There are 7 functional areas / ERP modules that are most often implemented in BUMDes, namely as follows:

1. Invoicing Management
This module is used to handle all financial data that occurs in BUMDes.
2. Inventory Management
This module is used to handle product stock and product movements related to shipping, receiving, storing and taking products.
3. Sales Management
This module is used to handle all sales transactions in BUMDes.
4. Purchase Management
This module is used to handle all sales transactions in BUMDes.
5. Manufacturing
This module is used to handle the production process from taking raw products from the warehouse to putting the finished products back into the warehouse.
6. Human Resource Management
This module is used for programs related to human resources such as employee management including payroll.
7. Customer Relationship Management
This module is used for customer-related programs.

The following ERP main module architecture is explained in the following figure.

Manufacturing		HRM
Purchasing	Sales	
Inventory		CRM
Accounting and Finance		

Fig 3. Main Module Architecture

Additional functional area / modules needed by BUMDes:

1. Rental Management
Rental management systems provide functionality to manage rental products, rental orders, rental contracts, shipping in, shipping out, price rates etc. in an easy and efficient way [11]. The rental management module is available on Odoo ERP. For Odoo version 11.0 the price to pay is \$ 170.28 in implementing the module. The module can also be run on Odoo version 10.0 [12].
2. Savings and Loans
The Saving and Loan / Savings and Loans module provides functionality to manage master, savings, loans, validation, report and configuration data. The module is created in Indonesian so it is easy to use. The Saving and Loan / Savings and Loans module is available on Odoo ERP. For Odoo version 11.0 the price to pay is \$ 1771.34 for a single install. The module can also be run on Odoo versions 10.0, 12.0 and 13.0 [13].

D. Business Function and Data

Business functions of the seven functional areas / modules most often implemented.

Functional Area	Business Function		
	Odoo	Adempiere	Dolibarr
CRM	Pipeline	-	-
	Quotations		
	Pipeline Reporting	-	-
Sales Management	Quotation Sales	Quotation	Commercial Proposal
	Sales Order	Sales order	Customer Orders
	Orders to Upsell	-	-

Functional Area	Business Function		
	Odoo	Adempiere	Dolibarr
	Products Sales	-	New line
	Sales Report	-	-
Purchase Management	Requests for Quotation	Requisition to invoice	Purchase Order
	Purchase Orders	Material Management	
	Product Purchase	Requisition to Invoice	Purchase Order
	Control Incoming Products	-	-
	Control Vendor Bills	-	-
Inventory Management	Stock Transfers	Shipments	Shipment
	Inventory Adjustments	-	-
	Scrap	-	Stock
	Run Scheduler	-	Commercial Proposal
	Products	-	Category
	Reordering Rules	-	-
	Inventory Report	-	-
	Inventory Valuation	-	Stock management

Functional Area	Business Function		
	Odoo	Adempiere	Dolibarr
	Product Moves	Shipments	Shipments
	Warehouse Management	Inventory management	-
	Unit of Measures	-	Lot Serial of Numbers
Manufacturing	Manufacturing Orders	Manufacturing Order	Manufacturing Order
	Work Order	-	-
	Bill of Materials	-	-
	Routings	Manufacturing Workflow	-
	Work Centers	-	-
Invoicing Management	Customer Invoices	Customer Invoices	Customer Invoice
	Customer Credit Notes	Credit order	-
	Vendor Bills	Supplier invoice	Suppliers Invoice
	Vendor Payments	Payments to suppliers	Vendor Payments
	Budgets	GL Budget	-
	Assets	-	-
	Manual Reconciliation	-	-
	Analytic Entries Reporting	-	-

Functional Area	Business Function		
	Odoo	Adempiere	Dolibarr
	Product Margins Reporting	-	-
	Journal Audit	Statement of Account	-
	Partner Ledger	-	-
	General Ledger	GL Journal	Reporting
	Trial Balance	Trial Balance	Reporting
	Balance Sheet	Financial Report	Reporting
	Profit and Loss	Cash Journal	Reporting
	Chart of Accounts	-	-
	Fiscal Positions	-	-
	Bank Accounts	-	Bank and Account
	Payment Terms	-	-
	Budgetary Positions	-	-
	Analytic Accounts	-	-
	Payments Acquires	-	-
HRM	Referral	-	-
	Employees	-	Employee
	Requirement	-	-

Functional Area	Business Function		
	Odoo	Adempiere	Dolibarr
	Expenses	-	Expense Report
	Appraisal	-	-
	Time Off	-	Leaves
	Surveys	-	Timesheet
	Attendances	-	Timesheet
	Time Sheet	-	-
	Payroll	-	-
Rental Management	Rental Quotation	-	-
	Rental Orders	-	-
	Rental Products	-	-
	Rental Product Variants	-	-
	Rental Contracts	-	-
	Rental Invoices	-	-
Saving and Loan	Master Data	-	-
	Savings/Tabungan	-	-
	Loans/Peminjaman Dana	-	-
	Validation	-	-
	Report	-	-

Data from each Business Function of the top 3 ERPs.

Business Function	Data		
	Odoo	Adempiere	Dolibarr
Pipeline	Sales Data (Product Data and Customer Data)	-	Sales List (Product Data and Customer Data)
Quotations	-	-	-
Pipeline Reporting	Customer Data	-	-
Quotation Sales	Saleable Product Data	-	Saleable Product Data
Sales Order	Customer Data, Saleable Product Data, Tax Data	-	Customer name, customer reference, date, discount, item name, item amount, tax, total payment.
Orders to Upsell	Customer Data, Saleable Product Data, Tax Data	-	-
Products Sales	Saleable Product Data	Saleable Product Data	Saleable Product Data
Sales Report	Customer Data	Customer Data, Saleable	-

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
		Product Data, Tax Data	
<i>Requests for Quotation</i>	Product Data	-	Product Data
<i>Purchase Orders</i>	Purchase data (Product Data and Vendor Data)	-	Product Data
<i>Product Purchase</i>	Product Data	-	-
<i>Control Incoming Products</i>	Purchase data (Product Data and Vendor Data)	Product Data	-
<i>Control Vendor Bills</i>	Product Data	Product Data and Warehouse Data	-
<i>Stock Transfers</i>	Warehouse / Inventory Data and Product Data	Product Data and Warehouse Data	Product Data and Warehouse Data
<i>Inventory Adjustment s</i>	Warehouse / Inventory Data and Product Data	-	-
<i>Scrap</i>	Product Data	-	Product Data and Warehouse Data

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
<i>Run Scheduler</i>	-	Product Data and Warehouse Data	-
<i>Products</i>	Product Data	-	Customer Data, Vendor / Supplier Data, and Product Data
<i>Reordering Rules</i>	Product Data		-
<i>Inventory Report</i>	Warehouse / Inventory Data and Product Data	-	-
<i>Inventory Valuation</i>	Warehouse / Inventory Data and Product Data		Product Data and Warehouse Data
<i>Product Moves</i>	Warehouse / Inventory Data and Product Data	-	Product Data and Warehouse Data
<i>Warehouse Manageme nt</i>	Warehouse / Inventory Data and Product Data	-	-
<i>Unit of Measures</i>	Product Data	-	Product Data
<i>Manufactu ring Orders</i>	Product Data	Product Data and	Product Data and

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
		Warehouse Data	Warehouse Data
<i>Work Order</i>	-	Product Data and Warehouse Data	-
<i>Bill of Materials</i>	-	-	-
<i>Routings</i>	Product Data	Product Data and Warehouse Data	-
<i>Work Centers</i>		-	
<i>Customer Invoices</i>	Customer Data, Saleable Product Data, Tax Data	-	-
<i>Customer Credit Notes</i>	Customer Data, Saleable Product Data	-	-
<i>Vendor Bills</i>	Vendor Data, Data Purchasable Products, Data Taxes		Product Data and Warehouse Data
<i>Vendor Payments</i>	Data Vendor, Data Purchasable Product	-	Product Data and Warehouse Data

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
<i>Budgets</i>	Budget Data	-	-
<i>Assets</i>	Asset Data	-	Product Data
<i>Manual Reconciliation</i>	Bank Account Data	Product Data and Warehouse Data	Product Data and Warehouse Data
<i>Analytic Entries Reporting</i>	Customer Data	Product Data and Warehouse Data	-
<i>Product Margins Reporting</i>	Saleable Product Data, Data Purchasable Product	-	-
<i>Journal Audit</i>	COA Data	Product Data and Warehouse Data	-
<i>Partner Ledger</i>	Vendor Data	-	
<i>General Ledger</i>	COA Data	-	Customer Data, Saleable Product Data, Tax Data
<i>Trial Balance</i>	COA Data	Product Data	-
<i>Balance Sheet</i>	COA Data		Vendor Data, Data Purchasabl

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
			e Products, Data Taxes
<i>Profit and Loss</i>	COA Data	Customer Data, Saleable Product Data, Tax Data	Vendor Data, Data Purchasabl e Products, Data Taxes
<i>Chart of Accounts</i>	COA Data	Customer Data, Saleable Products	-
<i>Fiscal Positions</i>	Tax Data	Vendor Data, Data Purchasabl e Product, Data	-
<i>Bank Accounts</i>	Bank Account Data	Data Vendor, Data Purchasabl e Product	-
<i>Payment Terms</i>	Vendor Data	Budget Data	-
<i>Budgetary Positions</i>	Budget Data	-	-
<i>Analytic Accounts</i>	COA Data	-	COA Data
<i>Payments Acquires</i>	Bank Account Data	-	COA Data
<i>Referral</i>	Employee data	-	COA Data

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
<i>Employees</i>	Employee data	COA Data	COA Data
<i>Recuirement</i>	Job Applicant Data	-	COA Data
<i>Expenses</i>	Employee Data, Expense data (Product data, Billing data)	COA Data	COA Data
<i>Appraisal</i>	Employee data	COA Data	-
<i>Time Off</i>	Employee Data, Attendance / Attendance Data	COA Data	-
<i>Surveys</i>	Employee Data	COA Data	Data Account Bank
<i>Attendance s</i>	Employee Data, Attendance / Attendance Data	-	-
<i>Time Sheet</i>	Employee Data, Attendance / Attendance Data	-	-
<i>Payroll</i>	Employee Data, Salary / Wage Data	-	-

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
<i>Rental Quotation</i>	Product Rental Data	-	-
<i>Rental Orders</i>	Product Rental Data, Customer Data	-	-
<i>Rental Products</i>	Product Rental Data	-	-
<i>Rental Product Variants</i>	Product Rental Data	-	-
<i>Rental Contracts</i>	Product Rental Data, Customer Data, Data Taxes	-	-
<i>Rental Invoices</i>	Customer Data, Product Rental Data, Data Taxes	-	-
<i>Master Data</i>	Member Data, Savings type data, Loan type data, COA Data	-	-
<i>Savings/ Tabungan</i>	Member Data, Savings type data	-	-
<i>Loans / Funds Loans</i>	Member Data, Data type of loan	-	-

<i>Business Function</i>	Data		
	Odoo	Adempiere	Dolibarr
<i>Validation</i>	Member Data, Savings type data, Loan type data, COA Data	-	-
<i>Report</i>	Member Data, Savings type data, Loan type data, COA Data	-	-

E. Implementation ERP Method

Following are the results of the new method for BUMDes adopted from ERP Life Cycle Esteves and Pastors.

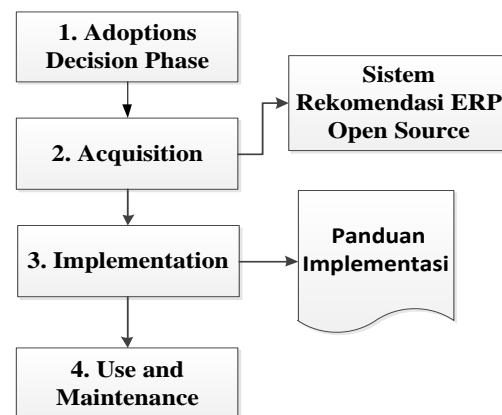


Fig 4. New method of ERP implementation in Bumdes

IV. CONCLUSION AND FUTURE WORK

In this section the conclusions and results of each of the steps taken by the research team are explained. Based on the analysis, development and implementation of ERP in BUMDes, the conclusions obtained from this Final Project are:

1. The research team has conducted BUMDes classification. In Toba Regency (2020) there are 102 BUMDes with 131 units in them. These BUMDes units are classified into 6 types of businesses based on the Regulation of the Minister of Villages, Development of Disadvantaged Areas, and Transmigration of the Republic of Indonesia Number 4 of 2015 Article 19. Following are the results of BUMDes classification.
 - a. There are 25 units of BUMDes type of social business
 - b. There are 11 units of BUMDes type of rental business
 - c. There are 9 units of BUMDes type of brokerage business
 - d. There is 1 unit of BUMDes type of joint venture / holding
 - e. There are 65 units of BUMDes type of trading business
 - f. There are 20 units of BUMDes type of financial business
2. The research team has conducted an analysis of the top 3 most frequent and suitable ERPs for BUMDes namely Odoo, Adempiere, Dolibarr. 7 Functional Area / Main module and 2 additional modules namely Invoicing, Manufacturing, Inventory, Sales, Purchase, CRM and HRM as the main module and Rental Management and Saving and Loan as additional modules.

The research team has implemented ERP on the Dosroha BUMDes in Pardomuan Motung Village, Ajibata District with the ERP Life Cycle method according to Esteves and Pastor. In the Adoption Decision Phase and Acquisition phase for ERP system impact analysis and finding vendors can be done through the ERP Recommendation System that has been developed by the research team based on ERP analysis, Funtional Area, Business Function and Data needed for ERP implementation. At the ERP Implementation stage, a guidance document is used to assist in ERP implementation. The guidance document can be seen in the ERP Guide document. In the Use and Maintanance Phase, namely training for end users of the ERP system, the research team conducted training for BUMDes. In the evaluation phase and retirement phase, the Research Team at BUMDes is not conducted. That is because, the BUMDes still need time to learn the ERP system so that there are no mistakes in implementing the system. Based on the results of research that has been done and the problems found during conducting research. The following are suggestions from the research team that can be done for further research.

1. In conducting research, the research team is still using literature studies to adjust the business functions of ERP on BUMDes. For further research, it is expected to conduct requirements on BUMDes as well as ERP analysis.
2. In conducting research, the research team implements implementation at the end of the study so that it cannot see the changes that occur in BUMDes after conducting

the implementation. For further research, implementation is expected to be carried out at the beginning of the study in order to see changes in the BUMDes.

REFERENCES

- [1] Indonesia, "Undang-Undang Republik Indonesia No. 6 Tahun 2014 tentang Desa.," 2014.
- [2] Z. Ridlwan, "Payung Hukum Pembentukan BUMDes," *Jurnal Ilmu Hukum*, p. 7(3), 2015.
- [3] P. A. Lestari and A. N. Sulistya, "Peran Pencapaian Tujuan Bumdes Mandiri Jaya dalam," *International Journal of Social Science and Business*, vol. 4, no. 1, pp. 47-57, 2020.
- [4] M. R. R. S. Anggraeni, "Peranan Badan Usaha Milik Desa (Bumdes) Pada Kesejahteraan Masyarakat Pedesaan Studi Pada Bumdes Di Gunung Kidul," *MODUS*, vol. 28 (2), pp. 155-167, 2016.
- [5] A. D. Ananda and D. Susilowati, "PENGEMBANGAN USAHA MIKRO KECIL DAN MENENGAH (UMKM) BERBASIS INDUSTRI KREATIF DI KOTA MALANG," *Jurnal Ilmu Ekonomi*, vol. 10, no. 10, p. 120 – 142, 2017.
- [6] P. W. Handayani, P. W. Handayani, J. Saputro, A. N. Hidayanto and I. Budi, "PETA RENCANA (ROADMAP) RISET ENTERPRISE RESOURCE PLANNING (ERP) DENGAN FOKUS RISET PADA USAHA KECIL DAN MENENGAH (UKM) DI INDONESIA," *Jurnal Sistem Informasi (Journal of Information System)*, vol. 6, no. 2, pp. 140-145, 2012.
- [7] N. and F. Alfianur, "Analisis Kesesuaian Kebutuhan Software Erp Terhadap Strategi Perusahaan Menggunakan Metode Analytical hierarchy process (Studi Kasus Alisha Fancy Shop)," *Jurnal Ekonomi Bisnis*, vol. 21, no. 1, pp. 83-89, 2016.
- [8] D. P. Hapsari, "Pengaruh Enterprise Resource Planning terhadap Kinerja Keuangan Perusahaan," *Owner (Riset dan Jurnal Akuntansi)*, vol. 3, no. 2, pp. 108-116, 2019.
- [9] L. Motiwalla and T. Jeffrey, *Enterprise Sistem for Management Second Edition*, New Jersey: Person New Internasional, 2014.
- [10] S. R. Magal and J. Word, *Integrated Business Processes with ERP Systems*, Wiley Publishing, 2011.
- [11] Desa, *PERATURAN MENTERI DESA PEMBANGUNAN DAERAH TERTINGGAL, DAN TRANSMIGRASI REPUBLIK INDONESIA NOMOR 4 TAHUN 2015* Pendirian. Pengurusan dan Pengelolaan, dan Pembubaran Badan Usaha Milik Desa, 2015.
- [12] S. CLIFFE, "ERP Implementation," *Harvard Business Review Harvard Business School Press*, vol. 77, no. 1, p. 16, 1999.
- [13] M. Al-Mashari, A. Al-Mudimigh and M. Zairi, "Enterprise resource planning: A taxonomy of critical factors," *European Journal of Operational Research*, p. 352–364, 2003.

- [14] J. Esteves and J. Pastor-Collado,, "Analysis of Critical Success Factors Relevance Along SAP Implementation Phases," *Americas Conference on Information Systems (AMCIS)*, 2001.
- [15] Odoo, "Odoo Rental: Features," Odoo, [Online]. Available: https://www.odoo.com/id_ID/page/rental-features. [Accessed 12 Juli 2020].
- [16] Odoo, "Odoo rental Management Enterprise: Odoo Apps Store," Odoo, [Online]. Available: https://apps.odoo.com/apps/modules/11.0/odoo_rental_management_enterprise/. [Accessed 12 July 2020].
- [17] Odoo, "Yudha Simpan Pinjam: Odoo Apps Store," Odoo, [Online]. Available: https://apps.odoo.com/apps/modules/13.0/yudha_simpan_pinjam/. [Accessed 12 July 2020].